

Claims

- [c1] What is claimed is:
1. An electronic circuit comprising:
a servo control and ECC decoder circuit for controlling a removable media device to obtain encoded data from a removable media, and for performing a decoding process to obtain decoded data from the encoded data and storing the decoded data in an external memory;
a graphics decoding circuit for decoding graphics data held in the external memory to generate video data and audio data; and
a memory controller to provide read and write access to the external memory for both the servo control and ECC decoder circuit and the graphics decoding circuit;
wherein the graphics decoding circuit performs a graphics decoding process on the decoded data to generate the video data and audio data.
 - [c2] 2. The electronic circuit of claim 1 wherein the graphics decoding circuit utilizes the memory controller to store the video data in the external memory.
 - [c3] 3. The electronic circuit of claim 1 further comprising video output circuitry for generating a video signal for an external display device according to the video data.
 - [c4] 4. The electronic circuit of claim 1 further comprising a communications pathway electrically linking the Servo control and ECC decoder circuit with the graphics decoding circuit to permit the servo control and ECC decoder circuit and the graphics decoding circuit to exchange information.
 - [c5] 5. The electronic circuit of claim 4 wherein the servo control and ECC decoder circuit further comprises a register accessible by the graphics decoding circuit that indicates the location of decoded data in the external memory.
 - [c6] 6. The electronic circuit of claim 4 wherein the servo control and ECC decoder circuit comprises a signal to indicate to the graphics decoding circuit that newly decoded data is available in the external memory.
 - [c7] 7. The electronic circuit of claim 1 wherein the servo control and ECC decoder

circuit is adapted to decode data received from a digital video disk (DVD) removable media, or a compact disk (CD) removable media.

[c8] 8. The electronic circuit of claim 7 wherein the servo control and ECC decoder circuit is adapted to control a DVD-type drive, or a CD-type drive.

[c9] 9. The electronic circuit of claim 1 wherein the graphics decoding circuit performs a Moving Picture Experts Group (MPEG) type graphics decoding process to generate the video data.

[c10] 10. The electronic circuit of claim 1 further comprising a monolithic substrate, the removable media device driver and decoder circuit, the graphics decoding circuit and the memory controller all fabricated on the monolithic substrate.

[c11] 11. The electronic circuit of claim 1 further comprising a packaging substrate, the removable media device driver and decoder circuit, the graphics decoding circuit and the memory controller all disposed within the packaging substrate.

[c12] 12. An electronic circuit fabricated on a monolithic substrate, the circuit comprising:
a servo control and ECC decoder circuit for controlling a removable media device to obtain encoded data from a removable media, and for performing a decoding process to obtain decoded data from the encoded data and storing the decoded data in an external memory;
a graphics decoding circuit for decoding graphics data held in the external memory to generate video data and audio data;
a memory controller to provide read and write access to the external memory for both the servo control and ECC decoder circuit and the graphics decoding circuit; and
a communications pathway enabling the servo control and ECC decoder circuit, the graphics decoding circuit and the memory controller to exchange information with each other.

[c13] 13. The electronic circuit of claim 1, wherein the servo control and ECC decoder circuit further comprises:
a first register indicating a first storage location in the external memory for the

encoded data from the removable media;
a second register indicating a second storage location in the external memory
for the decoded data which is decoded from the encoded data; and
a third register indicating a size of the decoded data.

[c14] 14. The electronic circuit of claim 13, wherein the second storage location overlaps the first storage location.

[c15] 15. The electronic circuit of claim 12, wherein the graphics decoder circuit further comprises:
a video head pointer indicating a first address where a newest video data is stored in the external memory;
an audio head pointer indicating a second address where a newest audio data is stored in the external memory;
a video tail pointer indicating a third address where an oldest video data is stored in the external memory;
an audio tail pointer indicating a fourth address where an oldest audio data is stored in the external memory,
wherein the video head pointer and the video tail pointer constitute a video circular buffer in the external memory, and the audio head pointer and the audio tail pointer constitute an audio circular buffer in the external memory.

[c16] 16. The electronic circuit of claim 15, wherein the graphics decoder circuit stops the graphics decoding process when either the video head pointer is about to write over the video tail pointer or the audio head pointer is about to write over the audio tail pointer, so as to prevent loss of the video data or the audio data respectively.

[c17] 17. The electronic circuit of claim 15, wherein the graphics decoder circuit resumes the video tail pointer when the video tail pointer advances close enough to the video head pointer, or resumes the audio tail pointer when the audio tail pointer advances close enough to the audio head pointer.